

WHAT IS CLAIMED IS:

1. A storage control device comprising:

a channel adapter which is connected to a upper device, and provides a first logical volume to the upper device and receives data which are sent from the upper device to the first logical volume,

a memory which is connected to the channel adapter and stores the data exchanged between the upper device and the memory, control information with respect to the data exchanged between the upper device and the memory, and configuration information with respect to the configuration of the storage control device,

a disk adapter which controls reading and writing the data, which are sent from the upper device to the first logical volume, from and onto the memory as being sent to a second logical volume which maps to the first logical volume and is used as a storing region in transmission and reception of the data between the channel adapter and the disk adapter,

an interconnection device which connects to the channel adapter, the memory and the disk adapter, and

a plurality of disk drives which are connected to the disk adapter, on which disk drives the data to the second logical volume are written by control of the disk adapter as data group having a redundant relation, and

the channel adapter providing logical volumes

which controls to the upper device, the logical volumes for control being utilized when the configuration information in the memory is read from the upper device, and the channel adapter having a processor which causes other second logical volume instead of the second logical volume to map to the first logical volume in response to a change-over indication issued from the upper device to the logical volume for control and further causing to operate spindle motors of the plurality of disk drives on which data group mapped to the other second logical volume and having redundant relation is written.

2.           The storage control device as set forth in claim 1 wherein the processor of the channel adapter causes to stop the spindle motors of the plurality of disk drives on which data group mapped to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written.

3.           The storage control device as set forth in claim 1 wherein the processor of the channel adapter judges whether the spindle motors of the plurality of disk drives are being operated or not, onto which disk drives the data group mapped to the other second logical volume designated by the change-over indication and having the redundant relation is written, and if the spindle motors are being operated, the processor causes the operation of the spindle motors to be

continued, and if the spindle motors are not operated, causes to operate the spindle motors of the plurality of disk drives on which the data group mapped to the other second logical volume and having the redundant relation is written.

4. The storage control device as set forth in claim 1 wherein if one mapped to the other second logical volume mapped to other first logical volume provided to the upper device exists in the plurality of disk drives on which the data group mapped to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written, the processor of the channel adapter causes the operation of the plurality of disk drives to be continued, on which disk drives the data group mapped to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written.

5. The storage control device as set forth in claim 1 wherein if one mapped to the other second logical volume mapped to other first logical volume provided to the upper device does not exist in the plurality of disk drives on which the data group mapped to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written, the processor of the channel adapter causes to stop the operation of the plurality of disk drives on which the data group mapped to the

second logical volume to be changed in response to the change-over indication and having the redundant relation is written.

6. The storage control device as set forth in claim 1 wherein in the case that kind of command sent from the upper device to the logical volume for control is a write command, the processor of the channel adapter writes the content of the write command on the logical volume for control and judges the content of the write command to be the change-over indication.

7. The storage control device as set forth in claim 1 wherein in the case that kind of command sent from the upper device to the logical volume for control is a read command, the processor of the channel adapter judges the read command to be the configuration information and reads the configuration information from the memory to send it to the upper device.

8. The storage control device as set forth in claim 1 further comprises a mapping change device which causes the other second logical volume instead of the second logical volume to map to the first logical volume in response to an indication of the processor of the channel adapter.

9. The storage control device as set forth in claim 1 further comprises a power control device, in response to an indication of the processor of the channel adapter, which stops the spindle motors of the plurality of disk drives on which the data group mapped

to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written, and which operates the spindle motors of the plurality of disk drives on which the data group mapped to other second logical volume and having the redundant relation is written.

10. The storage control device as set forth in claim 1 wherein in the case that the command sent from the upper device is addressed to the first logical volume, the processor of the channel adapter judges the command sent from the upper device to be a command concerning writing or reading of data, and in the case that the command sent from the upper device is addressed to the logical volume for control, the processor of the channel adapter judges the command sent from the upper device to be a command concerning the control information.

11. A method for controlling a storage control device, the device comprising

a channel adapter which is connected to a upper device, and provides a first logical volume to the upper device and receives data which are sent from the upper device to the first logical volume,

a memory which is connected to the channel adapter and stores the data exchanged between the upper device and the memory, control information with respect to the data exchanged between the upper device and the memory, and configuration information with respect to

the configuration of the storage control device,

a disk adapter which controls reading and writing the data, which are sent from the upper device to the first logical volume, from and onto the memory as being sent to a second logical volume which maps to the first logical volume and is used as a storing region in transmission and reception of the data between the channel adapter and the disk adapter,

an interconnection device which connects the channel adapter, the memory and the disk adapter, and

a plurality of disk drives which are connected to the disk adapter, on which disk drives the data to the second logical volume are written by control of the disk adapter as data group having a redundant relation,

wherein the channel adapter provides logical volumes for control to the upper device, the logical volumes for control being utilized when the configuration information in the memory is read from the upper device, and

the channel adapter causes other second logical volume instead of the second logical volume to map to the first logical volume in response to a change-over indication issued from the upper device to the logical volume for control and further causes to operate spindle motors of a plurality of disk drives on which data group mapped to the other second logical volume and having redundant relation is written.

12.           The method for controlling a storage control device as set forth in claim 11 wherein the channel adapter

causes to stop the spindle motors of the plurality of disk drives on which data group mapped to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written.

13.           The method for controlling a storage control device as set forth in claim 11 wherein the channel adapter

judges whether the spindle motors of the plurality of disk drives are being operated or not, on which disk drives the data group mapped to the other second logical volume designated by the change-over indication and having the redundant relation is written,

causes the operation of the spindle motors to continue, if the spindle motors are being operated, and

causes to operate the spindle motors of the plurality of disk drives on which the data group mapped to the other second logical volume and having the redundant relation is written, if the spindle motors are not operated.

14.           The method for controlling a storage control device as set forth in claim 11 wherein if one mapped to the other second logical volume mapped to other first logical volume provided to the upper device

exists in the plurality of disk drives on which the data group mapped to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written,

the channel adapter causes the operation of the plurality of disk drives to be continued, on which disk drives the data group mapped to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written.

15. The method for controlling a storage control device as set forth in claim 11 wherein if one mapped to the other second logical volume mapped to other first logical volume provided to the upper device does not exist in the plurality of disk drives on which the data group mapped to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written,

the channel adapter causes to stop the operation of the plurality of disk drives on which the data group mapped to the second logical volume to be changed in response to the change-over indication and having the redundant relation is written.

16. The method for controlling a storage control device as set forth in claim 11 wherein in the case that kind of command sent from the upper device to the logical volume for control is a write command,

the channel adapter writes the content of the



write command on the logical volume for control and judges the content of the write command to be the change-over indication.

17. The method for controlling a storage control device as set forth in claim 11 wherein in the case that kind of command sent from the upper device to the logical volume for control is a read command,

the channel adapter judges the content of the read command to be the configuration information,

reads the configuration information from the memory, and

sends the read configuration information to the upper device.

18. The method for controlling a storage control device as set forth in claim 11 wherein the storage control device includes a mapping change device,

the mapping change device

causes the other second logical volume instead of the second logical volume to map to the first logical volume in response to an indication of the channel adapter.

19. The method for controlling a storage control device as set forth in claim 11 wherein the storage control device includes a power control device,

the power control device

causes to stop the spindle motors of the plurality of disk drives on which the data group mapped to the second logical volume to be changed in response

to the change-over indication and having the redundant relation is written, in response to an indication of the processor of the channel adapter, and

causes to operate the spindle motors of the plurality of disk drives on which the data group mapped to other second logical volume and having the redundant relation is written.

20. The method for controlling a storage control device as set forth in claim 11 wherein the channel adapter

judges the command sent from the upper device to be a command concerning writing or reading of data, in the case that the command sent from the upper device is addressed to the first logical volume, and

judges the command sent from the upper device to be a command concerning the control information, in the case that the command sent from the upper device is addressed to the logical volume for control.